Product Manual and User Guide

for

62 100 – ThurayaIP Active Portable Antenna

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1. Introduction

Thank you for choosing a product from SCAN Antenna. This product has been carefully developed with your satisfaction in mind. SCAN Antenna believes in long relationships with its customers, and we hope that you will find the quality of this product satisfactory.

Contact info for SCAN Antenna:

SCAN Antenna A/S		Phone	(45) 43 33 16 20
Dyregårdsvej 1-3		Fax	(45) 44 94 10 99
DK-2740 Skovlunde		Email	info@scan-antenna.com
DENMARK		WWW	www.scan-antenna.com

If your antenna has been purchased through a distributor, please contact your distributor for support.

2. Functional description

This product,

ThurayaIP Active Portable Antenna (P/N 62 100)

is designed exclusively for use with a ThurayaIP terminal (model no. 9103, by Hughes Network Systems). The use of this antenna with any other products is not supported.

This antenna enables the use of the highest streaming IP rates of ThurayaIP, and improves performance for all other modes.

IP Data Services	
Background IP	Up to 444 Kbps over a shared channel
Streaming IP	Without External Antenna: 16, 32, 64, 128, 256 Kbps
	With External Antenna: 16, 32, 64, 128, 256, 384 Kbps

This antenna also enables the use of long cables between the ThurayaIP terminal and the antenna.

The antenna consists of a directional antenna, a High-Power Amplifier (HPA) for the uplink, a Low-Noise Amplifier (LNA) for the downlink, and the necessary power supply circuitry. This enables the antenna to meet the required satellite link specifications for the ThurayaIP system.

The antenna must have power available (see chapter 7), and the antenna must be pointed towards the satellite for proper operation.

3. Box contents

The antenna is delivered in a box containing all necessary accessories, except long coaxial cables, which are packaged separately.

- ThurayaIP Active Portable Antenna (battery included)
- AC charger
- AC power cord
- 1" Flange for optional mounting on bracket
- User guide (this document)
- DC – feeder (optional)

4. Safety

The antenna radiates electromagnetic waves when transmitting. In order to comply with current FCC RF Exposure limits, the antenna must be installed in a way such that no persons can placed directly in front of the antenna within the minimum safe distance. The minimum safe distance for this antenna is 60 cm (2 ft).

WARNING! Maintain a distance of 60 cm (2 ft) from the front of the antenna.

5. Mechanical features

5.1 Antenna placement on flat surface

The antenna can be placed on any flat surface. Adjustable handle allows the antenna to be fixed at the correct elevation angle. Consult the Thuraya IP user interface for the correct elevation and azimuth angles of your position.

Loosen the finger-screws (counter-clockwise), adjust the elevation angles, and tighten them again (clockwise).

5.2 Antenna mounting on camera tripod

The antenna has a threaded mount compatible with many camera tripods.

5.3 Antenna mounting on 1" bracket

The antenna comes with an extra adaptor for a 1" thread mount. The adaptor is mounted on the rear of the antenna, if needed.

The thread is of the type 1"-14 NF.

5.4 Storing and carrying the antenna

When storing the antenna, place the handle in the 'down' position, where the handle covers connectors and take up minimum amount of space.

When carrying the antenna, place the handle in the 'up' position.

6. Interface

The antenna has the following interfaces:

6.1 ON/OFF switch

The ON/OFF switch is used to turn the antenna on and off.

However, it is only in use if the power source of the antenna is the battery, please see chapter 5 for power options. If the power comes from the charger or the DC-feeder, the antenna will be on regardless of the position of the ON/OFF switch.
The primary purpose of the ON/OFF switch is to avoid battery discharge, if the antenna is not being used.

Power Source	Switch in ON position	Switch in OFF position
Battery only	Antenna is ON	Antenna is OFF
Battery with charger or Charger only	Antenna is ON, battery is being charged	Antenna is ON, battery is being charged
DC feeder	Antenna is ON, battery is not being charged	Antenna is ON, battery is not being charged
DC feeder and Charger	Not recommended	Not recommended

6.2 Power LED / Charging indicator

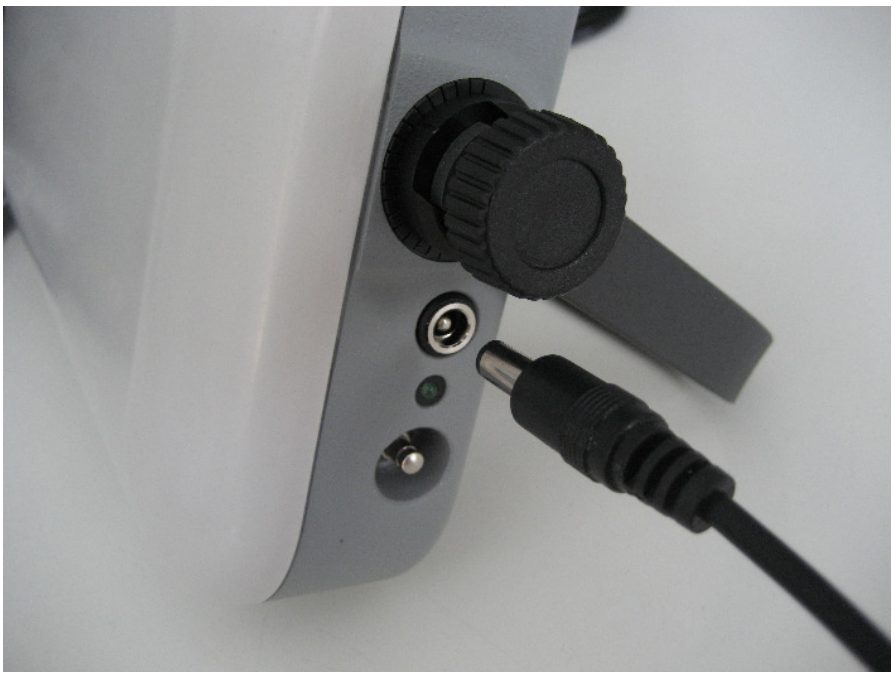
The Power LED indicates that the antenna has power (is turned on). The LED indicates these possible conditions:

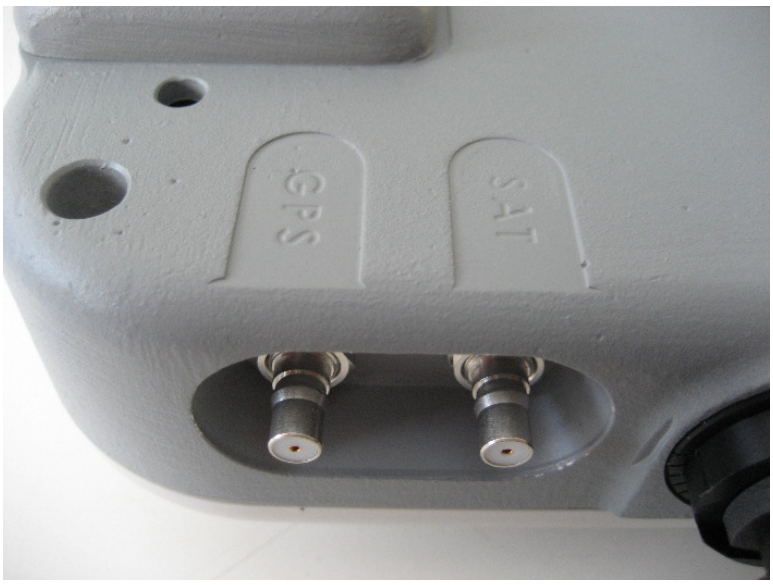
OFF	The antenna receives no DC power, neither from battery, charger or DC-feeder.
Flashing Green	The battery is being charged. The antenna can be used while charging. When the battery is fully charged, the flashing will be replaced by a constant ON.
ON	The antenna is turned on and is receiving DC power from the battery or the charger (and the battery is fully charged) or the DC-feeder.

6.3 Charger socket

Connect the charger here. The charger that comes with the antenna must be used. However, if it becomes necessary to use a replacement charger, the charger must meet the following specifications:

Output voltage:	18 – 24 V DC
Output current min. rating:	3 Amps
Connector:	2.5 mm male plug





6.4 SAT connector

This is a snap-on connector of type "QMA". It is the main interface between the ThurayaIP terminal and the antenna. This connector must always be connected, or no satellite connection will be possible.

This connector connects to the "Passive antenna" port of the ThurayaIP, even though it is an active antenna. Do not connect this port to the "Active antenna" port.

The passive antenna port has an SMB connector on the ThurayaIP, so the coaxial cable connection, including any jumpers, must have a male QMA connector on one end, and a female SMB connector on the other end.

6.5 GPS connector

This is a snap-on connector of type "QMA". It connects an active GPS antenna (internal to the ThurayaIP Antenna) to the ThurayaIP terminal. The GPS antenna has a completely separate power circuit, and the 3.3V necessary for the GPS antenna operation is provided by the ThurayaIP terminal.

The connection of the GPS antenna is optional. The ThurayaIP terminal needs a GPS position, but if one is not available, the last position from memory will be used, if it is not too old (please consult the ThurayaIP manual for more information on this point).

If it is not convenient to use the built-in GPS antenna, a separate GPS antenna can be used with the ThurayaIP terminal instead.

7. Power options

It is possible to power the antenna is several different ways:

7.1 Using battery

The antenna has a built-in Li-Ion battery. Only batteries approved by SCAN Antenna A/S may be used, in order to avoid damage to the antenna or the battery. Do not attempt to replace this battery with a different type.

The battery must be charged before use, using the correct charger. A fully discharged battery will charge to full capacity in approximately 1.5 hour.

When fully charged, the antenna can operate at maximum streaming rate for more than 1 hour. The following discharge times are approximate:

Standard IP mode	> 3 hours
Streaming IP 384 kbps	> 1 hour

There is no indication of discharge except the LED, so when the battery is discharged, the antenna will stop working.

7.2 Using charger

The charger can be used as a permanent source of power for the antenna. When the charger is plugged in, the antenna will operate continuously. Should AC power have a disruption, the battery (if mounted) will serve as a backup supply as indicated in the previous chapter.

The charger can also be used as permanent source of power when the battery is not connected.

7.3 Using DC-feeder

The use of a DC-feeder is intended primarily for fixed installations of the antenna. For a fixed installation using DC-feeder, the battery should be removed.

DC power must be connected to the DC-feeder. The antenna will be supplied by DC-power through the coaxial cable.

The DC-feeder power option is also useful when the antenna needs to be separated from the ThurayaIP terminal by a large distance. In this case the DC power supply can be adjacent to the ThurayaIP terminal, and the antenna will not need a separate DC connection.

The charger can be used to feed power to the DC-feeder.

In case a separate power supply or battery is used, the voltage should be 12V minimum and 24V maximum. The power supply should be capable of delivering 33W minimum.

8. Use of the antenna

To start using your antenna with ThurayaIP, please follow this simple step-by-step procedure:

1) If the satellite position on the sky is unknown, first use the ThurayaIP without external antenna, to determine the approximate elevation and azimuth angles.

2) Point the external antenna in the same direction.

3) Connect the coaxial cables between the ThurayaIP and the antenna. The GPS cable is optional. If you are outdoors, the GPS cable is not necessary. The internal GPS antenna of the ThurayaIP will suffice. When connecting the SAT cable, please be aware that once the cable is connected in both ends, the ThurayaIP will immediately reboot. This is normal behaviour.

4) Ensure the antenna has power available, either from battery, charger or DC-feeder.

5) Now the ThurayaIP will indicate that a 'Passive External Antenna' is present. This is normal behaviour.

6) Use the signal-strength indicator of the ThurayaIP to adjust the final position of the antenna. The signal strength indicator should be displaying signal strength immediately when the antenna is connected, even when the connection is still "acquiring".

7) Now all modes of the ThurayaIP will be available, including 384 kbps streaming in both links.

8) For further use, please consult the ThurayaIP User Guide.

9. Troubleshooting

Problem	Solution
No signal strength (0% - no bars)	Check that power is available to the antenna, LED should be ON. Check that the antenna is pointing towards the satellite. If problem persists, restart the ThurayaIP.
LED is not ON when running on battery	Antenna has no power. Check that power switch is ON. Battery may be discharged. Recharge or replace battery.
LED is not ON when running on charger	Antenna has no power. Check AC supply to charger.
LED is not ON when running on DC-feeder	Antenna has no power. Check DC power supply.
LED is flashing	Battery is charging. Normal behaviour.
Signal strength is OK, but the terminal never acquires a connection	Check that the coax cables are of the correct type and length. The coax cables may not be shortened, only replaced with other types. Please consult the cable guide.
When the antenna is connected, the ThurayaIP reboots, and the connection is temporarily lost	This is normal behaviour. To avoid this, connect the antenna before turning on the ThurayaIP.
Even with the antenna connected, the signal strength seems unstable	This is normal. Especially during acquisition, the signal strength varies a lot.

10. Cable guidelines

The antenna can be connected to the ThurayaIP terminal with different types and different lengths of coaxial cable. However, the insertion loss of the cable is critical to the correct function of the antenna, as the transmitted power from the antenna may not be too low nor too high. The following cables have been carefully selected to take this into consideration. The lengths of cable shown are therefore not maximum lengths only, but also minimum lengths. The RF insertion loss at 1600 MHz needs to be 5 dB.
The user may not alter the lengths of the cables. If a different length is needed for practical reasons, please change the cable type to the type suitable for that particular length.

Cable length	Cable type	Cable diameter	Cable weight
Meters (Feet)		Mm (inches)	Kg (lbs)
6m (20 ft)	RG58C/U	5.0 (0.20”)	0.25 kg (0.5 lbs)
10m (33 ft)	RF195	5.0 (0.20”)	0.37 kg (0.8 lbs)
15m (50 ft)	RF240	6.1 (0.24”)	0.75 kg (1.5 lbs)
30m (100 ft)	RF400	10.2 (0.40”)	3.0 kg (6.6 lbs)

The default cable is the 6m RG58. This cable is fitted with the necessary connectors for correct operation, SMB (female) for ThurayaIP and QMA (male) for the antenna.

For the cables with larger diameter, it is not always possible to fit the small connectors. In these cases, small adaptor cables will be included.

The information above relates to the SAT cable between the ThurayaIP and the antenna. However, the corresponding GPS cable will be of the same type and length.

For ordering information regarding cable sets, please consult the separate ordering information document.

11. Specifications

Thuraya part:

Receive mode G/T:	min. -18 dB/K, typ. -16 dB/K
Transmit mode EIRP:	min. 15 dBW, typ. 16 dBW
Frequency range:	1525.0–1559.0, 1626.5-1660.5 MHz
Polarisation:	LHCP, Axial ratio < 2 dB
Power supply (DC-feeder):	12-24 V DC
Power consumption:	min 3W, typ 18W, max 24W
Connector:	QMA female

GPS part:

RHCP patch antenna

Frequency:	1575.42 MHz
Gain:	25 dB
NF:	1.2 dB
Power supply:	3.0-5.5 V
Power consumption:	0.1W
Connector:	QMA female

General specifications:

Oper. Temp. range.

0C to +55C when using DC power
0C to +50C when using batteries
0C to +40C when charging batteries

Surv. Temp. range.

-20C to +60C with battery included
-40C to +85C without battery

Size:	WxHxD 270x155x60 mm
Weight:	1.80 kg
Color:	Light grey radome, Dark grey aluminum base.
Ingress Protection	IP55